Key learnings from the Projects

Using existing guidance:
There is a range of existing guidance developed to assist businesses and government in developing adaptation pathways in the context of climate change uncertainty.

Importance of focus and scope:
Project scoping takes time and significant engagement with the stakeholders to get a detailed understanding of potential issues relating to climate change. A critical part of scoping is the identification and testing of assumptions which, if not dealt with, can derail clear thinking about the issues and potential options.

Value of risk assessment:
The risk assessment process is an important step in understanding the extent of the problem. Simple assessment or modelling can be effective as a screening tool in excluding potential issues, but more detailed modelling is needed where issues are identified.

Iteration leading to greater understanding:
At any point in a project the partners will not have access to perfect knowledge; it is important to begin the process of adaptation being mindful of the need to revisit earlier decisions and evaluations in the light of new knowledge.

Governance as a critical barrier to resolve:
Governance is one of the most critical, and common, barriers to implementation of a Flexible Adaptation Pathway identified by the case studies.

Existing climate threats require action as well as future threats:
Almost all of the case studies identified that current climate, combined with urban development and an ageing asset base, already impact the performance of interconnected water infrastructure systems.

Financial analysis is complex and may be iterative.
Different approaches can be used to progress the FAP, and in many cases CBA will not be relevant and may only delay or confuse decision-making. Valuation of all inputs to CBA is difficult and alternative methods may be easier to communicate and more effective at engaging stakeholders in conversations.

Ways forward

Business as usual
Local Government has clear roles and responsibilities that need to be ongoing. Incorporating relevant aspects of adaptation into those core businesses, as modified practices and/or as prevention and preparedness planning allow business as usual while preparing for change.

It is not all about adaptation
Lance Armstrong said “its not about the bike”, drawing attention to the training, infrastructure, and support services that are required for any successful project. There is much to do that fits into Local Government responsibilities and adaptation is part of a broader discussion about Council priorities and management. Getting adaptation to the table is often about getting it into the broader program of works and asset management.

Climate change is not different
There is long history of government, and the private sector, planning in the face of uncertainty. This history provides ways forward based on deliberative and powerful engagement with all stakeholders. This practice is often about making a commitment to action rather than a simplistic move to a “solution”. Even the term “wicked problem” has been around longer than climate change. Perhaps we should pick up not just the word but what has been learnt about how to deal with such problems.

Project partners:

The Sydney Coastal Councils Group Inc. (SCCG) was established in 1989 to promote co-ordination between Member Councils on environmental issues relating to the sustainable management of the urban coastal environment. The Group consists of 15 Councils adjacent to Sydney marine and estuarine environments and associated waterways, and represents over 1.4 million Sydneysiders.

Funding
Funding has been provided by the Australian Government represented by the Department of Climate Change and Energy Efficiency.
Coastal Adaptation Decisions Pathways Projects (CAP) – an Australian Government initiative

Sydney Coastal Councils Group
Coastal Adaptation Pathways Projects (CAP)
Newsletter October 2012

Background

In July 2011, the Sydney Coastal Councils Group (SCCG) was awarded funding under the Australian Government’s Coastal Adaptation Decision Pathways Project (CAP) for three projects:

(1) Assessment and Decision frameworks for existing Seawalls
(2) Demonstrating Climate Change Adaptation of Interconnected Water Infrastructure Project, and
(3) Prioritising Coastal Adaptation and Development Options for Local Government.

Previous work by the SCCG, Systems Approach to Regional Climate Change Adaptation Strategies in Metropolises, has identified four key adaptation barriers associated with adaptation:

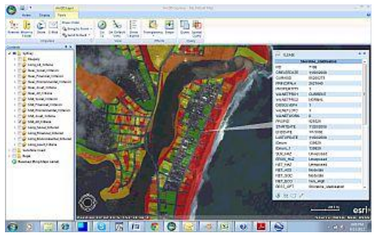
Context: The social and political context is always with us and as well there is the legacy of past decisions (planning, development, and infrastructure)
Structure: Lack of clear and useful guidance for Local Government. Multiple stakeholders and owners of infrastructure with different values and priorities
Process: Different responsibilities (“silos”) within and between Local and State Governments;
Outcomes: Few examples of good, productive, long term adaptations.

Outcomes

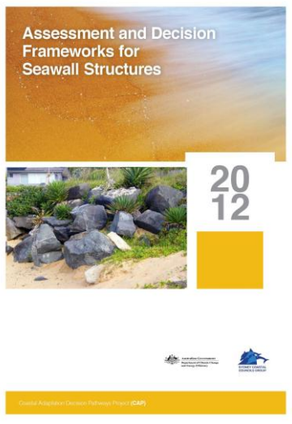
The three SCCG projects all address aspects of these barriers and are designed to propose ways forward for Local Government to improve their understanding of, and response to, the potential impacts from climate change.

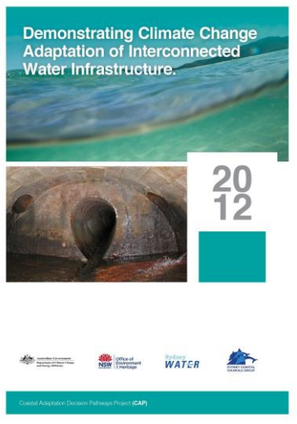
The Seawalls and Interconnected Water Infrastructure projects specifically look at how existing conditions affect these assets, and looks at ways forward for management. The legacy of these past decisions is both physical and social, and a key element is how management can be improved, taking into account our best understanding of current assets, risks and resilience, and incorporating climate change projections into future planning and asset management.

The Prioritisation of Coastal Adaptation Options is based on standard Multicriteria analysis methods and, by incorporating both property data and the values and beliefs of stakeholders, provides a visionary approach to incorporate property-scale information into vulnerabilities and options maps for consultation and planning.



Screen view of MCA showing coastal hazards with lot-scale data base.





Assessment and Decision Frameworks for Seawall Structures

Assessment and Decision Frameworks for Seawall Structures **project will assist Local and State Governments evaluate the robustness and condition of existing small seawalls of unknown construction and quality; including identifying/ quantifying what exists, defining likely future changes to design conditions, and outlining possible options for further upgrades.**

Outputs

The key outcome of the project is to raise awareness amongst coastal managers of the importance/risk associated with these existing protection structures. It is important that key construction details are documented and incorporated in asset management systems to support future management decisions.

Field data collection used new technology, including an air lance and ground penetrating radar, to investigate seawall structure and condition.

Case studies, of open water and estuarine seawalls, evaluated the potential performance of existing seawalls under climate change scenarios.

This is supported by additional advice on methodologies and the requirement to undertake more technical assessments to evaluate the engineering suitability and resilience of existing small seawalls.

It is intended that this work will integrate with standard Local Government management processes, and in preparing the Final Report we will identify Council asset management activities currently undertaken as well as other actions and processes in Council that could be applied to climate change adaptation i.e. cross sectorial, cross management working group.

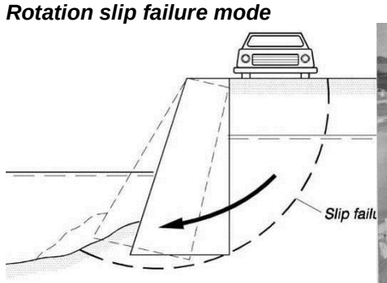
The project has designed tools to assist Local Government staffs to inspect, evaluate, and document small informal seawalls typically found around the Australian coast. These include:

- Guideline documents to support Local Government officers in assessing, documenting, and managing seawalls;
- Proforma assessment forms to assess and record the condition of existing seawalls, and
- An economic appraisal to assist in developing adaptation options for managing/upgrading seawalls.

Case studies investigated field data collection at Bilgola and Clontarf and provided data on the existing seawalls to assist management decision making.

The investigations used an air lance, and ground penetrating radar, to check subsurface features

Rotation slip failure mode



Demonstrating Climate Change Adaptation of Interconnected Water Infrastructure

Demonstrating Climate Change Adaptation of Interconnected Water Infrastructure **project aims to develop information, guidance and capacity building activities to ensure that organisations responsible for managing water infrastructure are able to implement appropriate asset management systems in a changing climate.**

Outputs

The Interconnected Water Infrastructure Project has used case studies to focus on assets owned and/or maintained by Sydney Water and/or local Council(s) that impact either directly or indirectly on interconnected or auxiliary assets owned/maintained by the other party. The cases included

- Sydney's CBD (existing development)
- Sydney's Green Square (urban redevelopment),
- Cooks River catchment,
- Wollongong interconnected coastal assets, and
- Berry Creek – North Sydney (environmental assets).

Each case study provided an opportunity to investigate:

- Climate change impacts on a range of water and wastewater infrastructure and implications for management
- Potential adaptation options for future management of water infrastructure based on existing information, climate change scenarios, and multiple stakeholders
- how economic analysis can be used to inform decision making for adaptation when incomplete data is not available
- Development of a structured decision support methodology to assist council officers and water infrastructure managers address issues of climate change where there are interconnected assets and management.

The work is presented in a Synthesis Report including case study evaluations, an interactive PDF tool, supported by an Instruction Manual. The approach uses a 6-step Framework to assist users to develop the key aspects of adaptation:

1. Focus and Scope
2. Risk assessment
3. Adaptation options
4. Flexible adaptation pathways
5. Implementation
6. Monitoring and evaluation.

The process is iterative, allowing users to begin with available data to start to scope and frame the project, and revisiting earlier steps in the process as more data (and perhaps new stakeholders) are brought into the project planning. The outcome is a Flexible Adaptation Pathway, and integrated Monitoring and Evaluation program.

Flooding in Sydney's CBD

On the 8 March 2012, Sydney experienced 109.4mm of rain in less than 12 hours. Statistically this was estimated to be less than a 2 year ARI event. The most intense rainfall occurred between 8am and 10am as the majority of Sydney workers were commuting to work and significant disruption occurred as buses were diverted or delayed and train stations inundated.

Prioritising Coastal Adaptation Development Options for Local Government

Prioritising Coastal Adaptation and Development Options for Local Government **Project aims to enhance the ability of coastal decision makers to evaluate and act on social, economic and environmental interests at the Local Government (LG) scale in the face of climate change.**

Outputs

A geographic information system (GIS) has been developed for the case study areas (the Sunshine Coast, Bega Valley, and Sydney) that identify different land uses as well as the potential risks of climate change (e.g. sea-level rise) and climate variability (e.g. storm events) to those land uses over different time scales. Risks of climate change to land use are based upon application of existing coastal sea-level rise inundation mapping.

Development of Bayesian Belief Networks (BBN) - The BBN are constructed as a simple, transparent network that represents the flow of information in the analysis among independent and dependent variables. The foundation for the BBN is a range of 'decision' nodes that represented the independent variables upon which information could be stratified:

1. adaptation options
2. study region
3. time horizons
4. public vs. private land
5. land subject to erosion
6. room available on property to increase coastal setback

The BBN are informed by the outputs of the workshops conducted earlier in the year to understand how different coastal adaptation options were perceived within the context of Local Government.

The Project Report describes methods, findings and recommendations for improved decision making for adaptation pathways, and provides map layers that visualise the different driving forces of adaptation decision-making, and compare adaptation options between cases where different drivers are in play, over different time scales.

Development of a Monitoring and Evaluation Framework – The Framework takes an holistic approach to look at:

1. Adaptation processes;
2. Organisational adaptive capacity; and
3. Adaptation outcomes,

using three different templates, to promote an holistic assessment of an organisation's capabilities and effectiveness, as well as a tool to evaluate implementation of options.

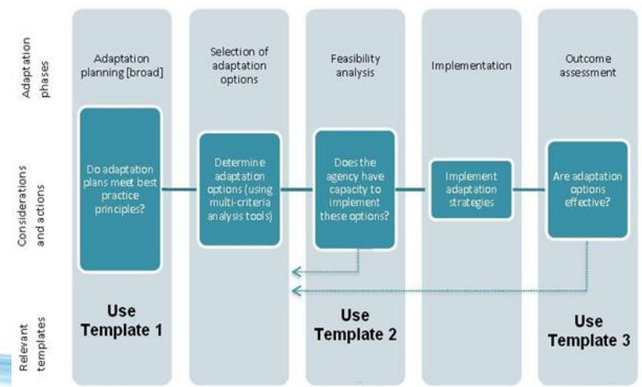


Figure 1 Schema of Local Government adaptation process indicating the role of evaluation and its uses